

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 1-10. (Cancelled).

1 11. (Currently amended) ~~A method~~ An apparatus for ~~of~~ retrieving and storing quality of
2 service policy management information using a directory service, comprising ~~the steps~~
3 ~~of~~:
4 a processor;
5 a network interface coupled to a managed network that receives network data from
6 one or more network devices that are in the managed network; and
7 one or more sequences of stored instructions accessible to the processor and which,
8 when executed by the processor, cause the processor to carry out the steps of:
9 receiving a validity period value of one of a plurality of directory information
10 trees that are created and stored in the directory service in association
11 with a directory information tree manager, wherein the validity period
12 value stores information that defines a time period in which a sub-tree
13 of a directory information tree, associated with the validity period
14 value, is valid, and wherein a valid ~~directory information tree~~ sub-tree
15 cannot be updated or modified;
16 providing, in the directory information tree manager, an active directory
17 information tree value that references a currently active directory
18 information tree, and an old directory information tree value that
19 references a formerly active directory information tree;
20 when quality of service policy management information is needed,
21 determining which one of the directory information trees is a currently
22 active directory information tree as indicated by the active directory
23 information tree value of the directory information tree manager; and
24 retrieving the quality of service policy management information from a sub-
25 tree of the currently active directory information tree only during the

26 time period within the validity period value thereof.

1 12. (Cancelled).

1 13. (Currently amended) ~~A method~~ The apparatus as recited in Claim 11, wherein
2 execution of the one or more sequences of stored instructions by the processor further
3 causes the processor to carry out the steps of further comprising the steps of:
4 providing a manager validity period value in the directory information tree manager;
5 and
6 retrieving the quality of service policy management information from the currently
7 active directory information tree only during a time period indicated by ~~within~~
8 the manager validity period value.

1 14. (Currently amended) ~~A method~~ The apparatus as recited in Claim 11, wherein
2 execution of the one or more sequences of stored instructions by the processor further
3 causes the processor to carry out the steps of further comprising the steps of:
4 providing a unique name value and a creation time value in each directory
5 information tree; and
6 retrieving the quality of service policy information from a directory information tree
7 only when its creation time value is unchanged since a previous retrieval from
8 that directory information tree.

1 15. (Currently amended) ~~A method~~ The apparatus as recited in Claim 11, wherein
2 execution of the one or more sequences of stored instructions by the processor further
3 causes the processor to carry out the steps of further comprising the steps of:
4 after retrieving the quality of service policy information,
5 (a) determining whether the current directory information tree is still valid based on
6 its validation period value;
7 (b) determining whether the current directory information tree has changed based on
8 its name value; and
9 (c) if either determination (a) or (b) is true, then deleting the retrieved quality of
10 service policy information and restarting retrieval of the quality of service

11 policy information.

1 16. (Currently amended) ~~A method~~ The apparatus as recited in Claim 11, wherein
2 execution of the one or more sequences of stored instructions by the processor further
3 causes the processor to carry out the steps of further comprising the steps of:
4 creating and storing a sub-tree of one or more quality of service policies;
5 setting the sub-tree as inactive;
6 validating consistency and error checking the sub-tree; and
7 modifying an active job value of a job manager to reference the sub-tree.

1 17. (Currently amended) ~~A method~~ An apparatus of retrieving and storing quality of
2 service policy management information using a directory service, comprising ~~the steps~~
3 ~~of:~~
4 a processor;
5 a network interface coupled to a managed network that receives network data from
6 one or more network devices that are in the managed network; and
7 one or more sequences of stored instructions accessible to the processor and which,
8 when executed by the processor, cause the processor to carry out the steps of:
9 creating and storing a plurality of directory information trees that are created
10 and stored in the directory service in association with a directory
11 information tree manager;
12 when quality of service policy management information is needed,
13 determining which one of the directory information trees is a currently
14 active directory information tree;
15 receiving a validity period value of the directory information tree manager,
16 wherein the validity period value stores information that defines a time
17 period in which a sub-tree of the currently active directory information
18 tree is valid, and wherein a valid ~~directory information tree~~ sub-tree
19 cannot be updated or modified;
20 if the validity period value of the directory information tree manager is
21 currently valid, then performing the steps of:

22 receiving a name value and a validity period value of a currently active
23 directory information tree; and
24 retrieving quality of service policy information from a sub-tree of the
25 active directory information tree only during the time period
26 indicated by the validity period value ~~of that active directory~~
27 ~~information tree~~ for the sub-tree.

1 18-25. (Cancelled).

1 26. (Currently amended) An apparatus for retrieving and storing quality of service policy
2 management information using a directory service, comprising:
3 means for receiving a validity period value of one of a plurality of directory
4 information trees that are created and stored in the directory service in
5 association with a directory information tree manager, wherein the validity
6 period value stores information that defines a time period in which a sub-tree
7 of a directory information tree, associated with the validity period value, is
8 valid, and wherein a valid ~~directory information tree~~ sub-tree cannot be
9 updated or modified;
10 means for determining, when quality of service policy management information is
11 needed, which one of the directory information trees is a currently active
12 directory information tree;
13 means for updating a particular sub-tree of the currently active directory information
14 tree, when the particular sub-tree is not valid, without copying contents of the
15 currently active directory information tree into another directory information
16 tree in response to receiving a request to update policy management
17 information stored in the currently active directory information tree; and
18 means for retrieving the quality of service policy management information from a
19 sub-tree of the currently active directory information tree only during the time
20 period within the validity period value thereof.

1 27. (Currently amended) An apparatus for retrieving and storing quality of service policy

2 management information using a directory service, comprising:
3 a processor;
4 a network interface coupled to a managed network that receives network data from
5 one or more network devices that are in the managed network; and
6 one or more sequences of stored instructions accessible to the processor and which,
7 when executed by the processor, cause the processor to carry out the steps of:
8 receiving a validity period value of one of a plurality of directory information
9 trees that are created and stored in the directory service in association
10 with a directory information tree manager, wherein the validity period
11 value stores information that defines a time period in which a sub-tree
12 of a directory information tree, associated with the validity period
13 value, is valid, and wherein a valid ~~directory information tree~~ sub-tree
14 cannot be updated or modified;
15 determining, when quality of service policy management information is
16 needed, which one of the directory information trees is a currently
17 active directory information tree;
18 in response to receiving a request to update policy management information
19 stored in the currently active directory information tree, updating a
20 particular sub-tree of the currently active directory information tree,
21 when the particular sub-tree is not valid, without copying contents of
22 the currently active directory information tree into another directory
23 information tree; and
24 retrieving the quality of service policy management information from a sub-
25 tree of the currently active directory information tree only during the
26 time period within the validity period value thereof.

1 28. (Currently amended) The ~~method of claim 1~~ apparatus of Claim 26, wherein the
2 Directory Information Trees and the Directory Information Tree Manager provide
3 consistency control over policy sub-trees that store quality of service policy
4 information.

1 29. (Currently amended) ~~A method~~ An apparatus comprising ~~the steps of:~~
2 a processor;
3 a network interface coupled to a managed network that receives network data from
4 one or more network devices that are in the managed network; and
5 one or more sequences of stored instructions accessible to the processor and which,
6 when executed by the processor, cause the processor to carry out the steps of:
7 testing a validity designation value after carrying out a read operation,
8 wherein the validity designation value is associated with one of a
9 plurality of directory information trees that are created and
10 stored in a directory service in association with a directory
11 information tree manager, and
12 wherein the plurality of directory information trees are associated with
13 quality of service policy information; and
14 verifying the validity of information that has been read during the read
15 operation by determining whether the validity designation value is
16 currently null.

1 30. (Currently amended) ~~A method~~ The apparatus as recited in Claim 29, wherein
2 execution of the one or more sequences of stored instructions accessible to the
3 processor further cause the processor to carry out the steps of further comprising:
4 creating and storing the validity designation value in association with each of a
5 plurality of directory information trees, in which the validity designation value
6 indicates whether the directory information tree is active, old, or to be erased;
7 and
8 retrieving the quality of service policy management information from one directory
9 information tree that has a validity designation value of "active," and only
10 during a time period within ~~the~~ a validity period value ~~thereof~~ associated with
11 a sub-tree storing the quality of service policy management information.

1 31. (Currently amended) ~~The method~~ apparatus of claim 29, ~~wherein the method is part of~~
2 ~~a step of retrieving and storing quality of service policy management information~~

3 ~~using a directory service, comprising the steps of retrieving and storing further~~
4 ~~comprising wherein execution of the one or more sequences of stored instructions~~
5 ~~accessible to the processor further cause the processor to carry out the steps of:~~
6 receiving [[the]] a validity period value of a sub-tree of one of the plurality of
7 directory information trees that are created and stored in the directory service
8 in association with a directory information tree manager;
9 when quality of service policy management information is needed, determining which
10 one of the directory information trees is a currently active directory
11 information tree;
12 retrieving the quality of service policy management information from a sub-tree of the
13 currently active directory information tree only during a time period within the
14 validity period value thereof.

1 32. (Currently amended) An apparatus comprising:

2 a machine readable medium carrying at least:

3 a plurality of directory information trees associated with quality of service
4 policy information, each directory information tree includes at least a
5 policy sub-tree that has at least one or more role objects, one or more
6 service template objects, and one or more policy decision point objects,
7 wherein the one or more role objects, one or more service template
8 objects, and one or more policy decision point objects are related to the
9 quality of service information; and
10 one or more sequences of stored instructions accessible to the processor and
11 which, when executed by a processor, cause the processor to carry out
12 the ~~steps~~ step of:
13 determining that one or more objects in one of the directory information
14 trees has been modified by a process and rewriting to the
15 directory service only such objects, service template objects,
16 and policy decision point objects as have been modified by the
17 process.

- 1 33. (New) An apparatus as recited in Claim 26, further comprising means for designating
2 one of the directory information trees as the currently active directory information tree
3 only when all read operations and write operations are complete with respect to that
4 directory information tree.
- 1 34. (New) An apparatus as recited in Claim 26, further comprising means for providing,
2 in the directory information tree manager, a reference to one or more old directory
3 information trees for use by a reading process that specifically requests retrieval of
4 obsolete quality of service policy information that is associated with the one or more
5 old directory trees.
- 1 35. (New) An apparatus as recited in Claim 26, further comprising:
2 means for creating and storing a validity designation value in association with each
3 directory information tree, in which the validity designation value indicates
4 whether the directory information tree is active, old, or to be erased;
5 means for retrieving the quality of service policy management information from a
6 sub-tree of a directory information tree that has a validity designation value of
7 "active," and only during a time period when the sub-tree is valid.
- 1 36. (New) An apparatus as recited in Claim 26, further comprising means for deleting an
2 obsolete directory information tree only after its validity period has expired.
- 1 37. (New) An apparatus as recited in Claim 36, further comprising means for testing the
2 validity designation value after carrying out a read operation, and means for verifying
3 validity of information that has been read by determining whether the validity
4 designation value is currently null.
- 1 38. (New) An apparatus as recited in Claim 26, further comprising means for determining
2 that one or more objects in a directory information tree has been modified by a
3 process and means for rewriting to the directory service only selected units of the
4 directory information tree.

1 39. (New) An apparatus as recited in Claim 26, wherein the particular sub-tree includes
2 one or more role objects, one or more service template objects, and one or more
3 policy decision point objects, and further comprising:
4 means for determining that in a particular object included in or referenced by the
5 particular sub-tree has been modified by a process, and
6 means for rewriting to the particular sub-tree only such objects, service template
7 objects, and policy decision point objects as have been modified by the
8 process.

1 40. (New) An apparatus as recited in Claim 27, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the step of
3 designating one of the directory information trees as the currently active directory
4 information tree only when all read operations and write operations are complete with
5 respect to that directory information tree.

1 41. (New) An apparatus as recited in Claim 27, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the step of
3 providing, in the directory information tree manager, a reference to one or more old
4 directory information trees for use by a reading process that specifically requests
5 retrieval of obsolete quality of service policy information that is associated with the
6 one or more old directory trees.

1 42. (New) An apparatus as recited in Claim 27, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the steps of:
3 creating and storing a validity designation value in association with each directory
4 information tree, in which the validity designation value indicates whether the
5 directory information tree is active, old, or to be erased;
6 retrieving the quality of service policy management information from a sub-tree of a
7 directory information tree that has a validity designation value of "active," and
8 only during a time period when the sub-tree is valid.

- 1 43. (New) An apparatus as recited in Claim 27, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the step of
3 deleting an obsolete directory information tree only after its validity period has
4 expired.
- 1 44. (New) An apparatus as recited in Claim 43, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the steps of:
3 testing the validity designation value after carrying out a read operation; and
4 verifying validity of information that has been read by determining whether the
5 validity designation value is currently null.
- 1 45. (New) An apparatus as recited in Claim 27, wherein execution of the one or more
2 sequences of stored instructions further cause the processor to carry out the step of
3 determining that one or more objects in a directory information tree has been
4 modified by a process and rewriting to the directory service only selected units of the
5 directory information tree.
- 1 46. (New) An apparatus as recited in Claim 27, wherein the particular sub-tree includes
2 one or more role objects, one or more service template objects, and one or more
3 policy decision point objects, and wherein execution of the one or more sequences of
4 stored instructions further cause the processor to carry out the steps of:
5 determining that in a particular object included in or referenced by the particular sub-
6 tree has been modified by a process; and
7 rewriting to the particular sub-tree only such objects, service template objects, and
8 policy decision point objects as have been modified by the process.
- 1 47. (New) The apparatus of Claim 27, wherein the Directory Information Trees and the
2 Directory Information Tree Manager provide consistency control over policy sub-trees
3 that store quality of service policy information.
- 1 48. (New) An apparatus, comprising:
2 means for testing a validity designation value after carrying out a read operation,

3 wherein the validity designation value is associated with one of a plurality of
4 directory information trees that are created and stored in a directory
5 service in association with a directory information tree manager, and
6 wherein the plurality of directory information trees are associated with quality
7 of service policy information; and
8 means for verifying the validity of information that has been read during the read
9 operation by determining whether the validity designation value is currently
10 null.

1 49. (New) The apparatus as recited in Claim 48, further comprising:
2 means for creating and storing the validity designation value in association with each
3 of a plurality of directory information trees, in which the validity designation
4 value indicates whether the directory information tree is active, old, or to be
5 erased; and
6 means for retrieving the quality of service policy management information from a
7 sub-tree of a directory information tree that has a validity designation value of
8 "active," and only during a time period when the sub-tree is valid.

1 50. (New) The apparatus of claim 48, further comprising:
2 means for receiving the validity period value of one of the plurality of directory
3 information trees that are created and stored in the directory service in
4 association with a directory information tree manager;
5 means for determining which one of the directory information trees is a currently
6 active directory information tree when quality of service policy management
7 information is needed; and
8 means for retrieving the quality of service policy management information from the
9 currently active directory information tree only during a time period within the
10 validity period value thereof.

1 51. (New) An apparatus for retrieving and storing quality of service policy management
2 information using a directory service, comprising:
3 means for receiving a validity period value of one of a plurality of directory

4 information trees that are created and stored in the directory service in
5 association with a directory information tree manager, wherein the validity
6 period value stores information that defines a time period in which a sub-tree
7 of a directory information tree, associated with the validity period value, is
8 valid, and wherein a valid sub-tree cannot be updated or modified;
9 means for providing, in the directory information tree manager, an active directory
10 information tree value that references a currently active directory information
11 tree, and an old directory information tree value that references a formerly
12 active directory information tree;
13 mean for, when quality of service policy management information is needed,
14 determining which one of the directory information trees is a currently active
15 directory information tree as indicated by the active directory information tree
16 value of the directory information tree manager; and
17 mean for retrieving the quality of service policy management information from a sub-
18 tree of the currently active directory information tree only during the time
19 period within the validity period value thereof.

1 52. (New) The apparatus as recited in Claim 51, further comprising:
2 means for providing a manager validity period value in the directory information tree
3 manager; and
4 means for retrieving the quality of service policy management information from the
5 currently active directory information tree only during a time period within the
6 manager validity period value.

1 53. (New) The apparatus as recited in Claim 51, further comprising:
2 means for providing a unique name value and a creation time value in each directory
3 information tree; and
4 means for retrieving the quality of service policy information from a directory
5 information tree only when its creation time value is unchanged since a
6 previous retrieval from that directory information tree.

1 54. (New) The apparatus as recited in Claim 51, further comprising:

means for, after retrieving the quality of service policy information, determining whether the current directory information tree is still valid based on its validation period value;

means for, after retrieving the quality of service policy information, determining whether the current directory information tree has changed based on its name value; and

means for, after retrieving the quality of service policy information, deleting the retrieved quality of service policy information and restarting retrieval of the quality of service policy information.

55. (New) The apparatus as recited in Claim 51, further comprising:

means for creating and storing a sub-tree of one or more quality of service policies;

means for setting the sub-tree as inactive;

means for validating consistency and error checking the sub-tree; and

means for modifying an active job value of a job manager to reference the sub-tree.

56. (New) An apparatus of retrieving and storing quality of service policy management information using a directory service, comprising:

creating and storing a plurality of directory information trees that are created and stored in the directory service in association with a directory information tree manager;

when quality of service policy management information is needed, determining which one of the directory information trees is a currently active directory information tree;

receiving a validity period value of the directory information tree manager, wherein the validity period value stores information that defines a time period in which the currently active directory information tree is valid, and wherein a valid directory information tree cannot be updated or modified;

if the validity period value of the directory information tree manager is currently valid, then performing the steps of:

receiving a name value and a validity period value of a currently active

16 directory information tree; and
17 retrieving quality of service policy information from the active directory
18 information tree only during the time period indicated by the validity
19 period value of that active directory information tree.